UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,361	02/13/2001	Yu-Wen Hu	4757US	1070

24247 7590 05/24/2002

TRASK BRITT
P.O. BOX 2550
SALT LAKE CITY, UT 84110

EXAMINER
STRZELECKA, TERESA E

ART UNIT	PAPER NUMBER
1637	12

DATE MAILED: 05/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/782,361	HU, YU-WEN	
	Examiner	Art Unit	
	Teresa E Strzelecka	1637	

-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This Office action is in response to an amendment filed on March 18, 2002.

2. A substitute specification was received and will be entered into the case.

Response to Arguments

3. Applicant's arguments filed on March 18, 2002 have been fully considered but they are not persuasive.

4. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., discrimination between genotypes which may vary by only a single nucleotide, no differentiation between low level variant species or low level heterozygote species, primers complementary to the variant region (page 5), use of the exo+ Pfu polymerase (page 8, second paragraph), automated analysis with DNA fragment polymorphism software (page 8, third paragraph) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

5. Applicant argues that Fahy does not provide conditions for using an alternative embodiment of the invention in which no ddNTPs are used and therefore it is not clear how the method would incorporate lack of ddNTPs. However, for one skilled in the art it would require only routine optimization to find the conditions under which Fahy's method can be used with incomplete set of dNTPs only. Therefore art rejections for claims 1-10 from the previous Office action are maintained.

6. Applicant argues that the 102(a) reference should not be included since the application claims priority to a Canadian application number 2,245,039, filed on August 13, 2002. The

rejection was made because the copy of the priority application is not present in the case. The rejection is maintained.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-10, 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Fahy (WO 96/30545).

Regarding claims 1, 2, 8 and 13-15, Fahy teaches a method of simultaneous determination of related polynucleotide sequences, for example, within the same gene, in a nucleic acid sample by:

- providing a nucleic acid sample which contains at least two related polynucleotide sequences, each with an identical region and a divergent region,
- providing a primer complementary to the identical regions,
- extending the primer into the divergent regions in the presence of a polymerase and an incomplete set of dNTP's (at most three),
- separating the extension products based on their lengths (page 7, lines 18-37).

Primers may be labeled with fluorescent labels (page 8, lines 12-14). Samples may be obtained from patients' cells, such as blood cells (page 29, lines 17-21). The polymerase used in the method is a high-fidelity polymerase (with 3'-> 5' exonuclease activity), such as Pfu (page 20, lines 3-34). Characterization of the extension products is achieved by comparing lengths of the extension

products using size separation methods, including gel electrophoresis, capillary electrophoresis or mass spectrometry (page 21, lines 3-14).

Regarding claim 3, a target nucleic acid from a sample may be amplified before the extension (page 17, lines 22-35).

Regarding claims 4 and 5, two or three dNTPs are used in primer extension (page 18, lines 26-30).

Regarding claim 6, labels may be fluorescent, luminescent or radioactive (page 15, lines 34-37; page 16, lines 1-3).

Regarding claim 7, dNTPs used for extension may be labeled (page 21, lines 27-31).

Regarding claims 9 and 10, extension products are analyzed on an automated sequencer with BioImage Analyzer software (page 34, lines 13-32).

9. Claims 1-7, 9-11 and 13-15 are rejected under 35 U.S.C. 102(a) as being anticipated by Hu et al. (Nucl. Acids Res., vol. 26, pp. 5013-5015, November 1, 1998).

Regarding claims 1-12, Hu et al. teach primer specific and mispair extension analysis (PSMEA) method, in which Pfu DNA polymerase is used to extend a template with an incomplete set of dNTPs, allowing detection of nucleotide variations. PCR-amplified HCV samples were subject to primer extension reactions using ^{32}P-labeled dNTPs or primers, with two or three dNTPs in one reaction. Primer extension products were separated by gel electrophoresis (Abstract, Fig. 1, Fig. 2). The results of primer extension were confirmed by direct sequencing (Fig. 3).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the

subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 11 and 12 (SEQ ID NO: 2, 6, 7) are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy as applied to claim 1 above, and further in view of Resnick et al. (U.S. Patent No. 5,527,669).

A) Claim 11 is drawn to an HCV genotype, and claim 12 to a primer selected from the group consisting of SEQ ID NO: 1-15.

B) Teachings of Fahy have been described above.

C) Resnick et al. teach oligonucleotide primers which can be used to amplify and detect HCV nucleic acids. Primers with SEQ ID NO: 8, 15 and 18 (overlapping with SEQ ID NO: 6, 7 and 2, respectively) can be used to amplify HCV genotypes from Japan , USA and HCV-C9 (col. 27, lines 57-66).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the HCV detection primers of Resnick et al. in the method of Fahy. The motivation to do so, expressly provided by Fahy, would have been that this method simultaneously detected related polynucleotides with different mutations, was performed in a single reaction and was amenable to automation.

12. Claims 11 and 12 (SEQ ID NO: 4) are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy as applied to claim 1 above, and further in view of Okamoto (U.S. Patent No. 5,550,016).

A) Claim 11 is drawn to an HCV genotype, and claim 12 to a primer selected from the group consisting of SEQ ID NO: 1-15.

B) Teachings of Fahy have been described above.

B) Okamoto teaches oligonucleotide primers which can be used to amplify and detect different HCV strains. Primer with SEQ ID NO: 18 (overlapping with SEQ ID NO: 4) can be used to detect HCV strains I-VI (col. 3, lines 34-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the HCV detection primer of Okamoto in the method of Fahy. The motivation to do so, expressly provided by Fahy, would have been that this method simultaneously detected related polynucleotides with different mutations, was performed in a single reaction and was amenable to automation.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa E Strzelecka whose telephone number is (703) 306-5877. The examiner can normally be reached on M-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached at (703) 308-1119. The fax phone numbers for the organization

where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

TS
May 21, 2002 TS

Kenneth R. Horlick

KENNETH R. HORLICK, PH.D
PRIMARY EXAMINER

5/22/02